EXTERNAL CONDITION TO ECO-BEHAVIOURS IN MELAKA GREEN CITY

Aisyah Abu Bakar[1], Siti Indati Mustapa[2], Norsyahida Mohammad[3]

[1,2,3] *Institute of Energy Policy and Research,*
UNIVERSITI TENAGA NASIONAL

Abstract

External Condition [EC] to eco-behaviours relates to the macro context of a person representing the person's façade towards his context. EC manifests in the perception and attitude towards surrounding circumstances such as the accessibility to conducive natural surroundings, encouragement to pro-environmental behaviours, convenience to be environmentally responsible and favourable law enforcement. *Issue:* 10 years has passed since the Green City Action Plan [MGCAP] and Sustainable Urban Development Framework [SUDF] were introduced. The Melaka EC to eco-behaviours needs to be assessed to determine the impact of the MGCAP and SUDF to EC of eco-behaviours. *Purpose:* This paper aims to compare the EC of Melaka residents to residents of other states in Malaysia. *Approach:* One-Way MANOVA was generated to determine the mean distribution of 10 EC items, across Malaysia States. *Findings:* There were significant differences within subjects of the 10 EC items between-subjects of Malaysia States. The Post-Hoc Test indicated almost all of the means of EC items for Melaka were higher than other states. The MGCAP and the SUDF shows a positive impact on the EC to a sustainable community.

Keyword: Melaka Green City, external condition

[1] Postdoctoral Researcher at Institute of Energy Policy and Research. Email: isya.ab@gmail.com

INTRODUCTION

Melaka state government and Melaka Green Technology Cooperation signed an MoU with Micro-E Holdings on August 10th, 2020, to continue the Melaka Green City Action Plan [MGCAP]. Micro-E Holding, a Malaysian private company promotes the use of clean renewable sources of energy in cutting back carbon emission to slow down global warming. The Green Cities Initiative recommends for Melaka (i) to improve understanding of the underlying causes that influence habitability of urban areas, (ii) enhance planning thereby resources are invested in the right place and correct scale, (iii) gather relevant data for well-informed investment decisions, (iv) pilot test projects to learn what works and what does not work prior to committing to large amounts of resources, (v) prepare better project designs to better the quality of the projects, and (vi) improve the institutions in such way that decisions are coordinated and with buy-in from key stakeholders. As a result of reliable coordination between multiple government agencies, the private sector, and local communities, Melaka city developed a systematic, inclusive and integrated management approach with project monitoring systems, data analysis, and citizen feedback. Accordingly, wastes are better managed and pollution are addressed with fast mitigation measures.

In this paper, the macro influence of Melaka ecological behaviours in response to the Green City vision is examined in opposition to other states in Malaysia. The fourth dimension of the 'Human Interdependence with the Environment' model by Abu Bakar, et al., (2017) is adopted to assess external condition of Melaka eco-behaviours in comparison to respondents from other Malaysia states.

LITERATURE REVIEW

The measures of contributions and functionality of individuals in the contexts of social and which in turn have an effect on the individual's well-being is termed Human Interdependence [HI] (Abu Bakar et al., 2019a; 2019b; 2019c; Abu Bakar et al., 2020a; 2020b; 2020c). Comprehensive studies on HI discovered that HI impart 70% of Subjective Well-Being, suggesting that that instigating well-being on others is a vital cause of individual well-being (Abu Bakar et al., 2015; 2016a; 2016b; 2017a; 2017b; 2017c; 2017d; 2017e; 2017f; 2017g; 2018). This paper focuses on Human Interdependence with the Environment [HIE].

A review was generated from The World Book of Happiness (Bormans, 2010), discussing worldwide findings of well-being and revealing four underlying dimensions of HIE. Summaries of recent studies from selected Asian articles are presented in the attempt to focus on HIE manifestation applicable for Malaysia. Potential determinants and conditional factors of HI are extracted from the articles. Among four interconnected HIE dimensions, this paper focuses on the fourth dimension of HIE, which is External Condition [EC].

External condition is related to the macro context of a person representing the person's façade towards his context. Thus, place concerns mainly on perception and attitude towards surrounding circumstances. In the environmental context, the instances of HI manifestations include the accessibility to conducive natural surroundings, encouragement to pro-environmental behaviours, convenience to be environmentally responsible and favourable law enforcement. The manifestations are observed in External Conditions [EC]. Studies on environmental surroundings, circumstances and policy enforcement are concerned on individuals' circumstances influencing responsible behaviours. Case studies selected from Asian Journals dated from the year 2011 onwards highlighted potential determinants and qualities EC (refer to Table 1).

Table 1: Conditional Factors to External Condition

Conditional Factors	Potential Determinants	References
Communal belief: The forest living quarter, subsistence source of living, spiritual realm, physical fulfilment and ancestral sentiment to be defended	Stability of social life (health and spiritual) in relation to natural setting	(Kamarul Zahari et al., 2011)
Unmaintained outdoor space: murky water that provides a place for mosquito breeding, too dense vegetation, and tall and bushy that blocked views.	Emotions and feelings (safety and security) induced in natural elements	(Maruthaveeran, 2012)
Motivation (to experience nature, to enjoy fresh air, to participate in sports, to enjoy natural beauty, to gain knowledge and to build confidence, to unwind, to rest and to gain social network); activities (appreciating nature, trekking and hill climbing, observing sunrise, observing hilltop scenery, making friends, and pampering self).	Feeling the urge to be in the nature, acquiring knowledge and ability to cope with the outdoors, and equipped physically, emotionally and intellectually for staying outdoor	(Zainol et al., 2012)
Housing value depended on a variety of park elements, conceptual or design of the park, distance to the park, views towards the park, and active areas in the park facing the house.	The inclination to be close to natural or outdoor areas, the urge to spend time in the outdoor environment	(Shukur et al., 2011)
Health condition and availability of natural environmental: Views and accessibility partly influenced conducive healing environment to outdoor natural environment facing patients' window.	Health-related condition, the need to see, hear, notice and experience in nature while being indoor or after being indoors for a while	(Ghazali & Abbas, 2011)
Physical well-being (active living); cognitive well-being (relief emotion, comfort, relaxed, and calmness, sense of privacy, solitude, and safety); and social well-being (social interaction with neighbours, participation, friendliness)	Having pleasant experience in natural setting, feeling relieved and relaxing emotions, and feeling energetic and healthy	(Mansor et al., 2012)
Accessibility to green open space (outdoor natural environment), and corresponding social health and behaviour (physical symptoms, stress, and anxiety disorder)	Health-related condition depending on outdoor environment, and the need for sufficient contact and interaction with nature	(Khotdee et al., 2012)
Stimulation of natural elements to encourage game-playing motivation (connectedness and continuity of green areas and flexibility of spaces and diversity of natural elements)	Sense of curiosity of natural elements and feeling engaged, creative and active in natural setting	(Faizi et al., 2013)
Age, gender, health-related conditions (stamina, health issues) and facilities in outdoor areas	Physical health and capability in outdoor areas	(Inani et al., 2013)
The physical setting of outdoor space: characteristics of groundcovers, open spaces, and tree foliage.	Ability to adapt and adjust to natural surrounding	(Ngesan et al., 2013)

Uniqueness of natural features and distinct character of landscape elements such as tree trunks, water fountain, and presence of animals	Curiosity of natural features (ability to see, hear, notice details of environment)	(Mahidin & Maulan, 2012)

EC manifests in the contextual circumstances and situational factors that influence and hinder individuals to think and act responsibly towards the environment. Qualities adhere to EC include (i) law enforcement and regulation, (ii) direct and indirect encouragement from the physical and social setting and (iii) convenience to be environmentally responsible (Abu Bakar et al., 2020a; 2020b; 2020c).

Table 2: Manifestation and Determinants of Interaction with Nature

Determinants	Qualities inferred through Indicators
law enforcement and regulation	regulation aspects, available information (campaign) and environmental movement,
direct and indirect encouragement from the physical and social setting	Support from social environment, surrounding health and quality of life, stakeholder willingness, favourable living area, conducive outdoors, stress-free environment, quality of neighbourhood surrounding
convenience to be environmentally responsible	situational factor, financial aspects, civic amenities, availability and proximity to environmental products and facilities, quality of public transportation

Table 3: Indicators of Interaction with Nature

Definition of EC	Components	Indicators	Code
The contextual circumstances and situational factors that influence and hinder individuals to think and act responsibly towards the environment	Surrounding Encouragement	having family members who support eco-friendly behaviours	EC1
		having a supportive, ethical climate at work	EC2
		having reachable conducive outdoors	EC3
		having a favourable neighbourhood that supports green politics	EC4
	Convenience	recognising accessibility to environmental products	EC5
		recognising affordability of environmental products	EC6
	Favourable Reinforcement	recognising favourable waste handling management	EC7
		recognising conducive surrounding and amenities	EC8
		recognising the efficiency of public transport infrastructure	EC9
		recognising legal enforcement on environmental destruction	EC10

The indicators were developed into statements in questionnaires to be answered by respondents across states in Malaysia.

METHOD
A sample of 4315 was pooled after the data screening process. The Malaysian respondents were given an 11-point Likert scale to respond to questionnaire items which consist of statements relating to the ten (10) EC items. One-Way Multivariate Analysis of Variance [MANOVA] was generated to determine the multivariate effect of Malaysia States on EC items. That is the difference in mean values of the 10 EC items combined between states. It is hypothesized that different states respond differently towards each of the 10 EC items. The following sections provide empirical evidence on the statistical interaction

between Malaysia States and the EC items. The report of the statistical outputs in the following section pay attention to Melaka in opposition to other states.

RESULTS AND DISCUSSION

One-Way MANOVA using Statistical Package for the Social Sciences [SPSS] was generated to determine the mean distribution of the dependent variables which were the 10 EC items, across the subjects of the independent variable, which was Malaysia States.

Prior to the One-Way MANOVA test, the data was screened for (i) missing cases, (ii) unengaged responses (SD $\neq$ 0), (iii) univariate and extreme outliers (boxplot and SD < 3.0), (iv) normality (skewness < 1.5, kurtosis < 3.0) and (v) linearity (r > 0.30). The data was also screened for (vi) multicollinearity (VIF < 3.0) and (vii) multivariate normality and influential outliers (Cook's Distance < 1.0). Since each state consists of more than 30 cases (>200 respondents), the MANOVA test was robust against violations of homogeneity of variance-covariance matrices assumption. It is also to note that the multivariate homogeneity of variance between group assumption using Levene's Test was violated (p < .001). Therefore, a stricter alpha level was used (α = 99.9%, p = .001) to interpret the univariate ANOVAs (Allen & Bennett, 2008).

One-Way MANOVA was conducted to determine significant differences within-subjects of EC items combined, between-subjects of Malaysia States. The deduced statistical hypothesis was:

H_0: *There were no significant differences within subjects of the 10 EC items between-subjects of Malaysia States. That is, Malaysia States have no multivariate effects on the 10 EC items.*

The statistical output revealed that **at 99% confidence level there was a statistically significant mean differences within-subjects of EC items between-subjects of states, F (140, 43000) = 6.423, p < .00001; Pillai's Trace V = .2052, partial $\eta 2$ = 020. The null hypothesis was rejected.** There were significant differences within-subjects of the 10 EC items between-subjects of Malaysia States. That is, Malaysia States had statistically significant multivariate effects on the 10 EC items, and the effect size was medium.

The One-Way MANOVA outputs, in essence, suggested that residents across the states reacted differently to each of the EC items. That is, the outcome, i.e. the mean values of each of the EC items were distinct from each other due to the different state they were coming from.

Table 3 shows the mean values of EC items across states. A radar chart was generated to demonstrate the difference in means of EC items across states. The chart shows that Melaka had high mean values for all of the EC items in

relation to other states. Table 4 tabulates the Tests Between-Subject Effects and Post-Hoc Comparison of Melaka Mean Values for EC items against other states.

Table 4: Descriptive Statistics: Mean Values of EC items

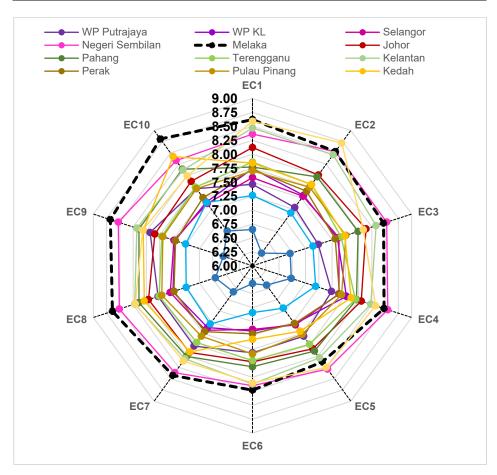| EC	MEL	PUT	KL	SEL	N9	JOH	PAH	TER	KEL	PER	PEN	KED	PERL	SAB	SAR
EC1	8.62	7.46	7.74	7.58	8.36	8.12	7.77	7.86	8.47	7.73	7.70	7.84	8.59	6.65	7.26
EC2	8.53	7.29	7.56	7.54	8.53	8.01	7.97	7.80	8.46	7.65	7.74	7.80	8.72	6.28	7.17
EC3	8.47	7.24	7.60	7.63	8.53	8.14	7.99	7.67	8.33	7.56	7.76	7.74	8.09	6.71	7.14
EC4	8.48	7.49	7.77	7.63	8.55	8.05	7.96	7.94	8.23	7.64	7.68	7.86	8.32	6.73	7.19
EC5	8.13	7.56	7.29	7.31	8.29	7.84	7.89	7.74	8.04	7.28	7.52	7.45	8.25	6.43	6.94
EC6	8.23	7.56	7.17	7.14	8.15	7.72	7.81	7.70	8.12	7.22	7.58	7.32	8.10	6.32	6.84
EC7	8.43	7.78	7.37	7.43	8.37	7.92	8.01	7.70	8.06	7.46	7.56	7.91	8.11	6.58	7.29
EC8	8.64	7.78	7.50	7.55	8.51	7.96	8.14	7.76	8.22	7.48	7.71	8.04	8.21	6.70	7.25
EC9	8.68	7.93	7.46	7.48	8.53	7.84	8.14	7.71	8.18	7.45	7.69	8.06	8.07	6.55	7.26
EC10	8.81	7.71	7.41	7.38	8.33	7.87	8.14	7.74	8.12	7.51	7.71	8.42	7.99	6.77	7.40

Figure 1. Radar Chart of EC Items Mean Values Across States

Table 5: Univariate ANOVAs and Post-Hoc Comparison of Melaka Mean Values

UNIVARIATE ANOVAs						
DV	Type III Sum of Squares	df	Mean Square	F	Sig.	η2
EC1	1183.121	14,4300	84.509	27.951	.000	.083
EC2	1686.490	14,4300	12.464	34.071	.000	.100
EC3	1039.088	14,4300	74.221	25.740	.000	.077
EC4	99.353	14,4300	7.740	24.183	.000	.073
EC5	1142.516	14,4300	81.608	25.066	.000	.075
EC6	127.758	14,4300	9.768	26.818	.000	.080
EC7	1013.125	14,4300	72.366	26.047	.000	.078
EC8	1094.174	14,4300	78.155	26.922	.000	.081
EC9	1222.962	14,4300	87.354	24.711	.000	.074
EC10	1123.564	14,4300	8.255	25.056	.000	.075

POST-HOC TESTS: MEAN DIFFERENCE OF MELAKA AGAINST OTHER STATES															
EC		PUT	KL	SEL	N9	JOH	PAH	TER	KEL	PER	PEN	KED	PERL	SAB	SAR
EC1	MD	**1.150**	**.880**	**1.040**	*.260*	*.490*	**.850**	**.750**	*.140*	**.890**	**.920**	**.780**	*.030*	**1.970**	**1.360**
	p	**.009**	**.001**	**.001**	*.973*	*.063*	**.001**	**.001**	*.999*	**.001**	**.001**	**.001**	*.999*	**.001**	**.001**
EC2	MD	**1.240**	**.970**	**.990**	*.001*	*.520*	*.560*	**.730**	*.070*	**.880**	**.800**	**.740**	*-.180*	**2.250**	**1.360**
	p	**.009**	**.001**	**.001**	*.999*	*.078*	*.075*	**.005**	*.999*	**.001**	**.001**	**.001**	*.999*	**.001**	**.001**
EC3	MD	**1.220**	**.870**	**.830**	*-.060*	*.330*	*.480*	**.800**	*.140*	**.910**	**.710**	**.730**	*.380*	**1.760**	**1.330**
	p	**.002**	**.001**	**.001**	*.999*	*.631*	*.128*	**.001**	*.999*	**.001**	**.001**	**.001**	*.607*	**.001**	**.001**
EC4	MD	*.999*	**.710**	**.850**	*-.060*	*.440*	*.530*	*.550*	*.250*	**.840**	**.800**	**.630**	*.160*	**1.750**	**1.300**
	p	*.048*	**.001**	**.001**	*.999*	*.160*	*.058*	*.066*	*.969*	**.001**	**.001**	**.004**	*.999*	**.001**	**.001**
EC5	MD	*.560*	**.830**	**.820**	*-.170*	*.290*	*.230*	*.380*	*.080*	**.850**	*.610*	**.680**	*-.120*	**1.690**	**1.180**
	p	*.886*	**.001**	**.001**	*.999*	*.875*	*.986*	*.667*	*.999*	**.001**	*.028*	**.003**	*.999*	**.001**	**.001**
EC6	MD	*.670*	**1.070**	**1.090**	*.080*	*.510*	*.420*	*.530*	*.120*	**1.010**	*.650*	**.910**	*.130*	**1.910**	**1.390**
	p	*.712*	**.001**	**.001**	*.999*	*.075*	*.435*	*.161*	*.999*	**.001**	*.016*	**.001**	*.999*	**.001**	**.001**
EC7	MD	*.650*	**1.060**	**1.010**	*.070*	*.520*	*.420*	**.740**	*.370*	**.970**	**.880**	*.520*	*.330*	**1.860**	**1.140**
	p	*.593*	**.001**	**.001**	*.999*	*.025*	*.281*	**.001**	*.567*	**.001**	**.001**	*.037*	*.801*	**.001**	**.001**
EC8	MD	*.860*	**1.140**	**1.090**	*.130*	**.680**	*.500*	**.880**	*.420*	**1.160**	**.930**	*.600*	*.420*	**1.940**	**1.390**
	p	*.177*	**.001**	**.001**	*.999*	**.001**	*.099*	**.001**	*.401*	**.001**	**.001**	**.007**	*.439*	**.001**	**.001**
EC9	MD	*.750*	**1.210**	**1.200**	*.150*	**.830**	*.540*	**.970**	*.500*	**1.230**	**.980**	*.620*	*.610*	**2.120**	**1.410**
	p	*.566*	**.001**	**.001**	*.999*	**.001**	*.115*	**.001**	*.251*	**.001**	**.001**	*.020*	*.077*	**.001**	**.001**
EC10	MD	*1.100*	**1.390**	**1.420**	*.480*	**.930**	*.660*	**1.070**	*.680*	**1.300**	**1.100**	*.380*	*.820*	**2.040**	**1.410**
	p	*.026*	**.001**	**.001**	*.294*	**.001**	**.005**	**.001**	**.006**	**.001**	**.001**	*.529*	**.001**	**.001**	**.001**

Note. MD= Mean Difference; p = p/significant value at 99% confidence level

COMPARISON MATRIX: MEAN VALUES OF MELAKA AGAINST OTHER STATES														
EC	Putra-jaya	K.Lum-pur	Sela-ngor	N.Sem-bilan	Johor	Pa-hang	Tereng-ganu	Kelan-tan	Perak	P.Pi-nang	Kedah	Perlis	Sabah	Sara-wak
EC1	+*	+*	+*	+	+	+*	+*	+	+*	+*	+*	+	+*	+*
EC2	+*	+*	+*	+	+	+	+*	+	+*	+*	+*	—	+*	+*
EC3	+*	+*	+*	—	+	+	+*	+	+*	+*	+*	+	+*	+*
EC4	+	+*	+*	—	+	+	+	+	+*	+*	+*	+	+*	+*
EC5	+	+*	+*	—	+	+	+	+	+*	+	+*	—	+*	+*
EC6	+	+*	+*	+	+	+	+	+	+*	+	+*	+	+*	+*
EC7	+	+*	+*	+	+	+	+*	+	+*	+*	+	+	+*	+*
EC8	+	+*	+*	+	+*	+	+*	+	+*	+*	+*	+	+*	+*
EC9	+	+*	+*	+	+*	+	+*	+	+*	+*	+	+	+*	+*
EC10	+	+*	+*	+	+	+*	+*	+*	+*	+*	+	+*	+*	+*

Note. +* = Melaka has significantly higher mean; + = Melaka has higher mean; — = Melaka has lower mean.

Table 5 shows that at 99% confidence interval there were statistically significant difference in all of the EC items between states and the effect sizes were all medium ($\eta2 = .010 < .031$ to $.052 < .138$). The Post-Hoc Test exhibits the mean difference in EC items of Melaka in opposition n to other states. The Post-Hoc Test on Melaka shows that almost all of the mean difference of Melaka compared to other states were positive.

The Comparison Matrix indicates that majority of EC items' means for Melaka were higher than EC items' means for other states. Out of the 140 cells, 135 cells revealed that Melaka had statistically higher means of EC items than other states and 81 out of the 135 cells were statistically significant. Table 6 shows the interpretation of the result.

Table 6: Result Interpretation

Items	Statements	Interpretation
EC1	*having family members who support eco-friendly behaviours*	Melaka had significantly higher means of EC1 than (i) Putrajaya, (ii) Kuala Lumpur, (iii) Selangor, (iv) Pahang, (v) Terengganu, (vi) Perak, (vii) Pulau Pinang, (viii) Kedah, (ix) Sabah, and (x) Sarawak.
EC2	*having a supportive, ethical climate at work*	Melaka had significantly higher means of EC2 than (i) Putrajaya, (ii) Kuala Lumpur, (iii) Selangor, (iv) Terengganu, (v) Perak, (vi) Pulau Pinang, (vii) Kedah, (viii) Sabah, and (ix) Sarawak.
EC3	*having reachable conducive outdoors*	Melaka had significantly higher means of EC3 than (i) Putrajaya, (ii) Kuala Lumpur, (iii) Selangor, (iv) Terengganu, (v) Perak, (vi) Pulau Pinang, (vii) Kedah, (viii) Sabah, and (ix) Sarawak.
EC4	*having a favourable neighborhood that supports green politics*	Melaka had significantly higher means of EC4 than (i) Kuala Lumpur, (ii) Selangor, (iii) Perak, (iv) Pulau Pinang, (v) Kedah, (vi) Sabah and (vii) Sarawak.
EC5	*recognising accessibility to environmental products*	Melaka had significantly higher means of EC5 than (i) Kuala Lumpur, (ii) Selangor, (iii) Perak, (iv) Kedah, (v) Sabah and (vi) Sarawak.
EC6	*recognising affordability of environmental products*	Melaka had significantly higher means of EC6 than (i) Kuala Lumpur, (ii) Selangor, (iii) Perak, (iv) Kedah, (v) Sabah and (vi) Sarawak.
EC7	*recognising favorable waste handling management*	Melaka had significantly higher means of EC7 than (i) Kuala Lumpur, (ii) Selangor, (iii) Terengganu, (iv) Perak, (v) Pulau Pinang, (vi) Sabah and (vii) Sarawak.
EC8	*recognising conducive surrounding and amenities*	Melaka had significantly higher means of EC8 than (i) Kuala Lumpur, (ii) Selangor, (iii) Johor, (iv) Terengganu, (v) Perak, (vi) Pulau Pinang, (vii) Kedah, (viii) Sabah and (ix) Sarawak.
EC9	*recognising the efficiency of public transport infrastructure*	Melaka had significantly higher means of EC9 than (i) Kuala Lumpur, (ii) Selangor, (iii) Johor, (iv) Terengganu, (v) Perak, (vi) Pulau Pinang, (vii) Sabah and (viii) Sarawak.
EC10	*recognizing legal enforcement on environmental destruction*	Melaka had significantly higher means of EC10 than (i) Kuala Lumpur, (ii) Selangor, (iii) Pahang, (iv) Pahang, (v) Terengganu, (vi) Kelantan, (v) Perak, (vi) Pulau Pinang, (vii) Perlis, (viii) Sabah and (ix) Sarwak.

The positive and significantly higher mean differences in EC items of Melaka than other states indicate that Melaka residents are more agreeable on all of the EC items compared to other states.

DISCUSSION

The Melaka Green City Action Plans [MGCAP] coordinate Melaka's commitment in adhering the low-carbon emission, bettering environmental quality, and reinforcing fiscal rivalry. The MCGAP renders a list of guidelines targeting to uphold the competitiveness of Melaka as a well-known tourist and investment destination, minimize environmental problems as well as present Melaka as an inspirational model city for the region's liveability. The MGCAP issues a clear passage towards transforming Melaka into a sustainable community, and it mirrors a holistic approach to muster many but isolated activities that have already begun. It also provides precise and explicit targets on what Melaka needs to do in the years to come.

The Sustainable Urban Development Framework [SUDF] is the entire development and monitoring framework that support the MGCAP. SUDF delivers underlying principles of accessibility, affordability, resilience, and sustainability as integrated approaches towards all-embracing urban development. Inclusive urban infrastructure development is the structured approach covering sustainable, resilient, accessible, and affordable solutions to the issues facing the urban poor and the vulnerable groups by improving access to urban services and infrastructure via targeted investments. The integrated approach fosters an interagency delivery medium to draw all institutions, stakeholders-government, the private sector, civil society and local communities for integrated urban service delivery. The approach suggests that the capacity of the urban poor communities, slum networks, and NGOs should be made more efficient in tandem with the city government and private sector.

Based on the findings, Melaka respondents highly experienced the external influence of (i) supportive family members, (ii) positive ethical climate at work, (iii) conducive outdoors, (iv) favourable neighbourhood, (v) access to environmental products, (vi) good waste handling management, (vii) conducive amenities, (viii) efficient public transport, and (ix) legal enforcement towards promoting environmental behaviours. The MGCAP and the SUDF have a positive impact on the external conditions to a sustainable community.

CONCLUSION

This paper compares the External Condition, the fourth dimension of Human Interdependence with the Environment, of Melaka residents in relation to other states. It was discovered that Melaka respondents were agreeable to all of the 10 EC statements implying macro influence to eco-behaviours. Future studies exploring the constructs elaborated in this paper via structural causal modelling and expand the findings through moderation effects of Malaysia States in relation to local environmental policies would be beneficial to observe the impact of policies on the changing surroundings.

REFERENCES

Abu Bakar, A., Mohamed Osman, M., Bachok, S., Ibrahim, M., & Mohamed, M. Z. (2015). Modelling Economic Wellbeing and Social Wellbeing for Sustainability: A Theoretical Concept. *Procedia Environmental Sciences*, *28*, 286–296. https://doi.org/https://doi.org/10.1016/j.proenv.2015.07.037

Abu Bakar, A., Mohamed Osman, M., Bachok, S., & Ibrahim, M. (2016a). Investigating Rationales of Malaysia Quality of Life and Wellbeing Components and Indicators. *Procedia - Social and Behavioral Sciences*, *222*, 132–142. https://doi.org/https://doi.org/10.1016/j.sbspro.2016.05.202

Abu Bakar, A., Mohamed Osman, M., Bachok, S., Ibrahim, M., & Abdullah, M. F. (2016b). Sustainable Well-Being: An Empirical Exploration on Human Needs and Human Interdependency. *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners*, *XIV*, 29–38. https://doi.org/http://dx.doi.org/10.21837/pmjournal.v14.i5.181

Abu Bakar, A., Mohamed Osman, Mariana Bachok, S., Ibrahim, M., Abdullah, A. (2017a). Sustainable Well-Being: An Empirical Exploration on Human Interdependence with the Environment. *Advanced Science Letters*, *23*(7), 6357-6361(5). https://doi.org/https://doi.org/10.1166/asl.2017.9269

Abu Bakar, A., Mohamed Osman, M., Bachok, S., & Ibrahim, M. (2017b). Sustainable Well-Being Subjective Indicators: Human Interdependence with Other Humans and with the Environment. In B. McLellan (Ed.), *Sustainable Future for Human Security* (pp. 301–318). Springer, Singapore. https://doi.org/https://doi.org/10.1007/978-981-10-5433-4_21

Abu Bakar, A., Mohamed Osman, M., Bachok, S., Ibrahim, M., & Abdullah, A. (2017c). Assessment on Subjective Sustainable Well-Being for Central Region of Malaysia. *Advanced Science Letters*, *23*(4), 929-2933(5). https://doi.org/https://doi.org/10.1166/asl.2017.7609

Abu Bakar, A., Mohamed Osman, M., Bachok, S., & Abdullah, A. (2017d). Sustainable Well-Being Objective Indicators: Basic Necessities, Complementary Needs and Desired Opportunities. In B. McLellan (Ed.), *Sustainable Future for Human Security* (pp. 175–188). Springer, Singapore. https://doi.org/https://doi.org/10.1007/978-981-10-5433-4_12

Abu Bakar, A., Mohamed Osman, M., Bachok, S., Zen, I., & Faris Abdullah, M. (2017e). A Review on Sustainable Wellbeing Indicators for Human Interrelationships with the Enviroment. *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners*, *15*(1), 357–368. https://doi.org/http://dx.doi.org/10.21837/pmjournal.v15.i1.252

Abu Bakar, A., Mohamed Osman, M., Bachok, S., Zen, I., Abdullah, A., & Abdullah, M. F. (2017f). A Theoretical Assessment on Sustainable Wellbeing Indicators for People Interrelationships. *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners*, *15*(1), 21–30. https://doi.org/http://dx.doi.org/10.21837/pmjournal.v15.i1.219

Abu Bakar, A., Mohamed Osman, M., Bachok, S., Hitam, M., & Abdullah, A. (2018). Human Interdependency for Sustainable Well-Being: Structural Invariance across Settlement Areas. *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners*, *16*(1), 281–293.

https://doi.org/http://dx.doi.org/10.21837/pmjournal.v16.i5.431

Abu Bakar, A., Mohamed Osman, M., & Abdullah, M. F. (2019a). Empowering Community Movement: Empirical Evidence. In *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners* (Vol. 17, Issue 2). Malaysian Institute Of Planners. https://doi.org/10.21837/pmjournal.v17.i10.648

Abu Bakar, A., Mohamed Osman, M., & Abdullah, M. F. (2019b). Personal Empowerment as Determinants of Organisational Opportunity. *Planning Malaysia*, *17*(2), 302–311. https://doi.org/10.21837/pmjournal.v17.i10.650

Abu Bakar, A., Mohamed Osman, M., & Abdullah, M. F. (2019c). Predictability of Positive Relationships through Personal Empowerment. *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners*, *17*(2), 302–311. https://doi.org/http://dx.doi.org/10.21837/pmjournal.v17.i10.651

Abu Bakar, A., Mohamed Osman, M., Hitam, M., Eleena Zainudin, F., Suzilawati Rabe, N., & Faris Abdullah, M. (2020). The Impact of Personality and Lifestyle on Interaction with Nature. In *Journal of the Malaysian Institute of Planners* (Vol. 18).

Abu Bakar, A., Osman, M. M., Hitam, M., Bakar, A. A., Osman, M. M., & Hitam, M. (2020a). Personality and Lifestyle Interprets External Condition to Environmental Behaviours. *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners*, *18*(1), 56–65.

Abu Bakar, A., Osman, M. M., Hitam, M., Bakar, A. A., Osman, M. M., & Hitam, M. (2020b). Attitudes and Pro-Environmental Behaviours: Determining Factor of Personality and Lifestyle. *PLANNING MALAYSIA Journal of the Malaysia Institute of Planners*, *18*(1), 1–10.

Allen, P. J., & Bennett, K. (2008). *SPSS for the Health and Behavioural Sciences* (First). Thomson.

Faizi, M., Azaria, a K., & Maleki, S. N. (2013). Design Guidelines of Residential Environments to Stimulate Children's Creativity. *Journal of Asian Behavioural Studies*, *3*(February 2013), 25–36.

Ghazali, R., & Abbas, M. Y. (2011). Paediatric Wards: Healing environment assessment. *Asian Journal of Environment-Behaviour Studies*, *2*(January 2011), 63–75. https://doi.org/10.1016/j.sbspro.2012.12.217

Inani, D. I., Abdul Karim, H., & Mohd Amin, M. Z. (2013). Walking Behavior of Urban and Rural Streets. *Journal of Asian Behavioral Studies*, *11*(July 2013), 97–110.

Kamarul Zahari, N. F., Omar, M., & Daim, S. (2011). Lawad, Ye' Yo' and Tum Yap : The manifestation of forest in the lives of the Bateks in Taman Negara National Park. *Journal of Asian Behavioral Studies*, *1*(January 2011), 29–40. https://doi.org/10.1016/j.sbspro.2012.04.181

Khotdee, M., Singhirunnusorn, W., & Sahachaisaeree, N. (2012). Effects of Green Open Space on Social Health and Behaviour of Urban Residents: A Case Study of Communities in Bangkok. *Procedia - Social and Behavioral Sciences*, *36*, 449–455. https://doi.org/10.1016/j.sbspro.2012.03.049

Mahidin, A. M. M., & Maulan, S. (2012). Understanding Children Preferences of Natural Environment as a Start for Environmental Sustainability. *Procedia - Social and Behavioral Sciences*, *38*(December 2010), 324–333. https://doi.org/10.1016/j.sbspro.2012.03.354

Mansor, M., Said, I., & Mohamad, I. (2012). Experiential Contacts with Green Infrastructure's Diversity and Well-being of Urban Community. *Asian Journal of Environment-Behaviour Studies*, *49*(May 2010), 33–48. https://doi.org/10.1016/j.sbspro.2012.07.024

Maruthaveeran, S. (2012). The Perception of Social Safety in a Green Environment: A Preliminary Study at the Kepong Metropolitan Park. *Journal of Asian Behavioral Studies*, *1*(January 2010), 45–56.

Mohamed Osman, M., Bachok, S., Abdullah, A., Ibrahim, M., & Bakar, A. A. (2017). Analysis on the Fulfillment of Hierarchy of Needs for Central Region of Malaysia. *Advanced Science Letters*, *23*(1), 417-421(5). https://doi.org/https://doi.org/10.1166/asl.2017.7203

Ngesan, M. R., Karim, H. A., & Zubir, S. S. (2013). Human Behaviour and Activities in Relation to Shah Alam Urban Park during Nighttime. *Asian Journal of Environment-Behaviour Studies*, *4*(October 2013). https://doi.org/10.1016/j.sbspro.2012.12.239

Shukur, F., Othman, N., & Nawawi, A. H. (2011). The Values of Parks to the House Residents. *Asian Journal of Environment-Behaviour Studies*, *1*(5), 85–94. https://doi.org/10.1016/j.sbspro.2012.07.033

Zainol, R., Nordin, N. A., Sandri, D., & Ahmad, F. (2012). Nature Seekers within the Urban Vicinity. *Joruanl of Surveying, COnstruction and Property*, *3*(2), 1–13.